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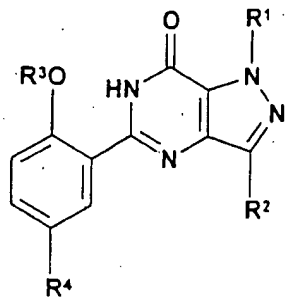
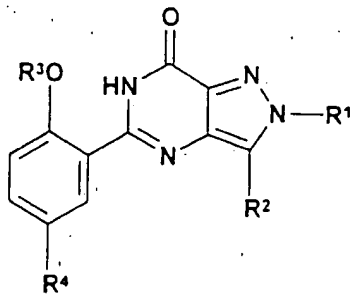
CLAIMS

1. A compound of formula (IA) or (IB):



(IA)



(IB)

or a pharmaceutically or veterinarily acceptable salt thereof, or a pharmaceutically or veterinarily acceptable solvate of either entity,

wherein R^1 is C_1 to C_3 alkyl substituted with C_3 to C_6 cycloalkyl, $CONR^5R^6$ or a N-linked heterocyclic group selected from pyrazolyl, imidazolyl, triazolyl, pyrrolidinyl, piperidinyl, morpholinyl and 4-R^9-piperazinyl; $(CH_2)_nHet$ or $(CH_2)_nAr$;

R^2 is C_1 to C_6 alkyl;

R^3 is C_1 to C_6 alkyl optionally substituted with C_1-C_4 alkoxy;

R^4 is $SO_2NR^7R^8$;

R^5 and R^6 are each independently selected from H and C_1 to C_4 alkyl optionally substituted with C_1 to C_4 alkoxy, or, together with the nitrogen atom to which they are attached, form a pyrrolidinyl, piperidinyl, morpholinyl or 4-R^9-piperazinyl group;

R^7 and R^8, together with the nitrogen atom to which they are attached, form a 4-R^{10}-piperazinyl group;

R^9 is C_1 to C_4 alkyl;

R^{10} is H or C_1 to C_4 alkyl optionally substituted with OH, C_1 to C_4 alkoxy or $CONH_2$;

Het is a C-linked 6-membered heterocyclic group containing one or two nitrogen atoms, optionally in the form of its mono-N-oxide, or a C-linked 5-membered heterocyclic group containing from one to four heteroatoms selected from nitrogen, oxygen and sulphur, wherein either of said heterocyclic groups is optionally substituted with one or two substituents selected from C_1 to C_4 alkyl optionally substituted with C_1 to C_4 alkoxy, C_1 to C_4 alkoxy, halo and NH_2;

Ar is phenyl optionally substituted with one or two substituents selected from C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halo, CN, $CONH_2$, NO_2, NH_2, $NHSO_2$ (C_1 to C_4 alkyl) and SO_2NH_2;

and n is 0 or 1.

2. A compound according to claim 1 wherein R^1 is C_1 to C_2 alkyl substituted with C_3 to C_5 cycloalkyl, $CONR^5R^6$ or a N-linked heterocyclic group selected from pyrazolyl, triazolyl, morpholinyl and 4-R^9-piperazinyl; $(CH_2)_nHet$ or $(CH_2)_nAr$; R^5 is H and R^6 is C_1 to C_4 alkyl optionally substituted with C_1 to C_4 alkoxy or R^5 and R^6, together with the nitrogen atom to which they are attached, form a morpholinyl group; Het is selected from pyridinyl, 1-oxidopyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, imidazolyl, isoxazolyl, thiazolyl, triazolyl and oxadiazolyl, any of which is optionally substituted with one or two substituents selected from CH_3, $CH_2CH_2OCH_3$, OCH_3 and NH_2; and R^2, R^3, R^4, R^9, Ar and n are as previously defined in claim 1.

3. A compound according to claim 2 wherein R^1 is C_1 to C_2 alkyl substituted with cyclobutyl, $CONR^5R^6$, pyrazol-1-yl, 1,2,3-triazol-1-yl, 1,2,4-

triazol-1-yl, morpholin-4-yl or 4-methylpiperazin-1-yl; pyrimidin-2-yl; CH_2Het or $(CH_2)_nAr$; R^2 is C_1 to C_3 alkyl; R^3 is C_1 to C_3 alkyl optionally substituted with C_1 to C_2 alkoxy; R^5 is H and R^6 is C_1 to C_2 alkyl optionally substituted with C_1 to C_2 alkoxy or R^5 and R^6, together with the nitrogen atom to which they are attached, form a morpholin-4-yl group; R^{10} is C_1 to C_2 alkyl optionally monosubstituted with OH, OCH_3 or $CONH_2$; Het is selected from pyridin-2-yl, 1-oxidopyridin-2-yl, pyridin-3-yl, pyridazin-3-yl, pyridazin-4-yl, pyrimidin-4-yl, pyrimidin-5-yl, pyrazin-2-yl, 3-methoxypyridin-2-yl, 6-aminopyridin-2-yl, 1-methylimidazol-2-yl, 3,5-dimethylisoxazol-4-yl, 2-methylthiazol-4-yl, 1-methyl-1,2,4-triazol-5-yl, 1-(2-methoxyethyl)-1,2,4-triazol-5-yl, 4-methyl-1,2,4-triazol-3-yl, 3-methyl-1,2,4-triazol-5-yl, 1,2,4-oxadiazol-3-yl and 5-methyl-1,2,4-oxadiazol-3-yl; Ar is selected from phenyl, 4-chlorophenyl, 4-bromophenyl, 2-cyanophenyl, 2-carbamoylphenyl, 4-carbamoylphenyl, 2-nitrophenyl, 4-nitrophenyl, 2-aminophenyl, 4-aminophenyl, 2-methanesulphonamidophenyl, 4-methanesulphonamidophenyl, 4-ethanesulphonamidophenyl, 4-(prop-2-ylsulphonamido)phenyl and 4-sulphamoylphenyl; and n is as previously defined in claim 2.

4. A compound according to claim 3 wherein R^1 is cyclobutylmethyl, morpholin-4-ylcarbonylmethyl, 2-(morpholin-4-yl)ethyl, pyrimidin-2-yl, CH_2Het or $(CH_2)_nAr$; R^2 is CH_2CH_3 or $CH_2CH_2CH_3$; R^3 is CH_2CH_3, $CH_2CH_2CH_3$ or $CH_2CH_2OCH_3$; R^{10} is CH_3, CH_2CH_3 or CH_2CH_2OH; Het is selected from pyridin-2-yl, pyridazin-3-yl, pyrazin-2-yl, 3-methoxypyridin-2-yl, 6-aminopyridin-2-yl, 1-methylimidazol-2-yl, 3,5-dimethylisoxazol-4-yl, 1-methyl-1,2,4-triazol-5-yl, 1-(2-methoxyethyl)-1,2,4-triazol-5-yl and 5-methyl-1,2,4-oxadiazol-3-yl; Ar is selected from phenyl, 2-aminophenyl, 2-methanesulphonamidophenyl, 4-methanesulphonamidophenyl, 4-ethanesulphonamidophenyl and 4-(prop-2-ylsulphonamido)phenyl; and n is as previously defined in claim 3.

5. A compound according to claim 4 wherein the compound of formula (IA) or (IB) is selected from

5-{5-[4-(2-hydroxyethyl)piperazin-1-ylsulphonyl]-2-n-propoxyphenyl}-3-n-propyl-1-(pyridin-2-yl)methyl-1,6-dihydro-7H-pyrazolo[4,3-d]pyrimidin-7-one;

1-(1-methylimidazol-2-yl)methyl-5-[5-(4-methylpiperazin-1-ylsulphonyl)-2-n-propoxyphenyl]-3-n-propyl-1,6-dihydro-7H-pyrazolo[4,3-d]pyrimidin-7-one;

5-{5-[4-(2-hydroxyethyl)piperazin-1-ylsulphonyl]-2-n-propoxyphenyl}-3-n-propyl-2-(pyridin-2-yl)methyl-2,6-dihydro-7H-pyrazolo[4,3-d]pyrimidin-7-one;

5-[5-(4-ethylpiperazin-1-ylsulphonyl)-2-n-propoxyphenyl]-3-n-propyl-2-(pyridin-2-yl)methyl-2,6-dihydro-7H-pyrazolo[4,3-d]pyrimidin-7-one;

3-ethyl-5-[5-(4-ethylpiperazin-1-ylsulphonyl)-2-n-propoxyphenyl]-2-(pyridin-2-yl)methyl-2,6-dihydro-7H-pyrazolo[4,3-d]pyrimidin-7-one;

5-[5-(4-ethylpiperazin-1-ylsulphonyl)-2-n-propoxyphenyl]-3-n-propyl-2-(pyridazin-3-yl)methyl-2,6-dihydro-7H-pyrazolo[4,3-d]pyrimidin-7-one;

5-[5-(4-ethylpiperazin-1-ylsulphonyl)-2-n-propoxyphenyl]-3-n-propyl-2-(pyrazin-2-yl)methyl-2,6-dihydro-7H-pyrazolo[4,3-d]pyrimidin-7-one; and

5-[2-ethoxy-5-(4-ethylpiperazin-1-ylsulphonyl)phenyl]-3-n-propyl-2-(pyridin-2-yl)methyl-2,6-dihydro-7H-pyrazolo[4,3-d]pyrimidin-7-one.

6. A pharmaceutical composition comprising a compound of formula (IA) or (IB), or a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate of either entity, according to any one of claims 1 to 5, together with a pharmaceutically acceptable diluent or carrier.

7. A veterinary formulation comprising a compound of formula (IA) or (IB), or a veterinarily acceptable salt thereof, or a veterinarily acceptable solvate of either entity, according to any one of claims 1 to 5, together with a veterinarily acceptable diluent or carrier.

8. A compound of formula (IA) or (IB), or a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate of either entity, according to any one of claims 1 to 5, or a pharmaceutical composition containing any of the foregoing according to claim 6, for use as a human medicament.

9. A compound of formula (IA) or (IB), or a veterinarily acceptable salt thereof, or a veterinarily acceptable solvate of either entity, according to any one of claims 1 to 5, or a veterinary formulation containing any of the foregoing according to claim 7, for use as an animal medicament.

10. The use of a compound of formula (IA) or (IB), or a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate of either entity, according to any one of claims 1 to 5, for the manufacture of a human medicament for the curative or prophylactic treatment of a medical condition for which a cGMP PDE5 inhibitor is indicated.

11. The use of a compound of formula (IA) or (IB), or a veterinarily acceptable salt thereof, or a veterinarily acceptable solvate of either entity, according to any one of claims 1 to 5, for the manufacture of an animal medicament for the curative or prophylactic treatment of a medical condition for which a cGMP PDE5 inhibitor is indicated.

12. The use of a compound of formula (IA) or (IB), or a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate containing either entity, according to any one of claims 1 to 5, for the manufacture of a human medicament for the curative or prophylactic treatment of male erectile dysfunction, female sexual dysfunction, premature labour, dysmenorrhoea, benign prostatic hyperplasia (BPH), bladder outlet obstruction, incontinence, stable, unstable and variant (Prinzmetal) angina, hypertension, pulmonary hypertension, congestive heart failure, atherosclerosis, stroke, peripheral vascular disease, conditions of reduced blood vessel patency, chronic asthma, bronchitis, allergic asthma, allergic rhinitis, glaucoma or diseases characterised by disorders of gut motility.

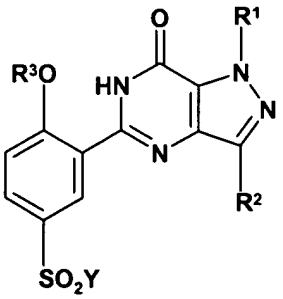
13. The use of a compound of formula (IA) or (IB), or a veterinarily acceptable salt thereof, or a veterinarily acceptable solvate containing either entity, according to any one of claims 1 to 5, for the manufacture of an animal medicament for the curative or prophylactic treatment of male erectile dysfunction, female sexual dysfunction, premature labour, dysmenorrhoea, benign prostatic hyperplasia (BPH), bladder outlet obstruction, incontinence, stable, unstable and variant (Prinzmetal) angina, hypertension, pulmonary hypertension, congestive heart failure, atherosclerosis, stroke, peripheral vascular disease, conditions of reduced blood vessel patency, chronic asthma, bronchitis, allergic asthma, allergic rhinitis, glaucoma or diseases characterised by disorders of gut motility;

14. A method of treating or preventing a medical condition for which a cGMP PDE5 inhibitor is indicated, in a mammal (including a human being), which comprises administering to said mammal a therapeutically effective amount of a compound of formula (IA) or (IB), or a pharmaceutically or veterinarily acceptable salt thereof, or a pharmaceutically or veterinarily acceptable solvate of either entity, according to any one of claims 1 to 5, or a pharmaceutical composition or veterinary formulation containing any of the foregoing according to claim 6 or claim 7.

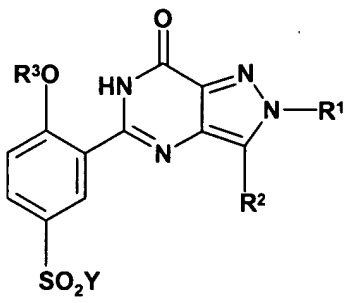
15. A method of treating or preventing male erectile dysfunction, female sexual dysfunction, premature labour, dysmenorrhoea, benign prostatic hyperplasia (BPH), bladder outlet obstruction, incontinence, stable, unstable and variant (Prinzmetal) angina, hypertension, pulmonary

hypertension, congestive heart failure, atherosclerosis, stroke, peripheral vascular disease, conditions of reduced blood vessel patency, chronic asthma, bronchitis, allergic asthma, allergic rhinitis, glaucoma or diseases characterised by disorders of gut motility in a mammal (including a human being), which comprises administering to said mammal a therapeutically effective amount of a compound of formula (IA) or (IB), or a pharmaceutically or veterinarily acceptable salt thereof, or a pharmaceutically or veterinarily acceptable solvate of either entity, according to any one of claims 1 to 5, or a pharmaceutical composition or veterinary formulation containing any of the foregoing according to claim 6 or claim 7.

16. A compound of formula (IIA) or (IIB):



(IIA)

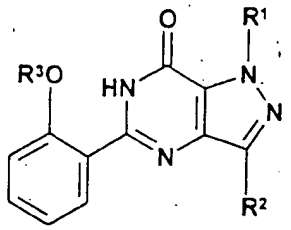


(IIB)

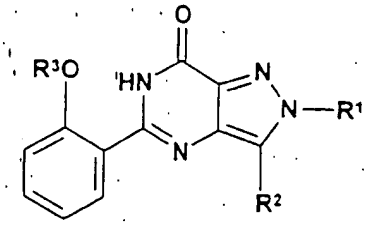
wherein Y is halo, and R^1, R^2 and R^3 are as previously defined in claim 1.

17. A compound according to claim 16 wherein Y is chloro.

18. A compound of formula (IVA) or (IVB):



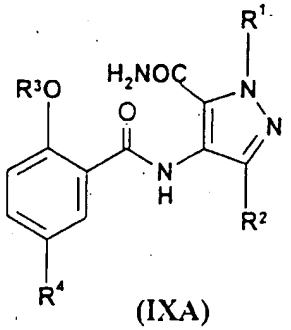
(IVA)



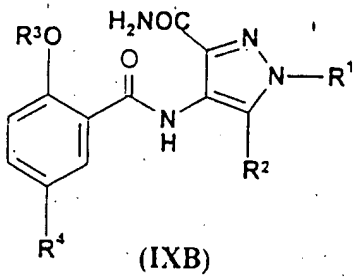
(IVB)

wherein R^1, R^2 and R^3 are as previously defined in claim 1.

19. A compound of formula (IXA) or (IXB):



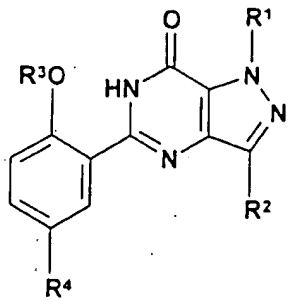
(IXA)



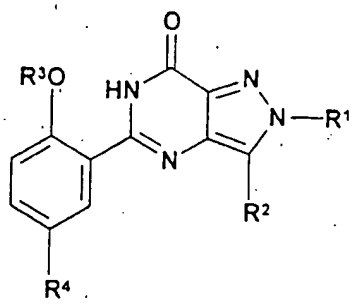
(IXB)

wherein R^1, R^2, R^3 and R^4 are as previously defined in claim 1.

20. A process for the preparation of a compound of formula (IA) or (IB):



(IA)



(IB)

or a pharmaceutically or veterinarily acceptable salt thereof, or a pharmaceutically or veterinarily acceptable solvate of either entity,

wherein R^1 is C_1 to C_3 alkyl substituted with C_3 to C_6 cycloalkyl, $CONR^5R^6$ or a N-linked heterocyclic group selected from pyrazolyl, imidazolyl, triazolyl, pyrrolidinyl, piperidinyl, morpholinyl and 4-R^9-piperazinyl; $(CH_2)_nHet$ or $(CH_2)_nAr$;

R^2 is C_1 to C_6 alkyl;

R^3 is C_1 to C_6 alkyl optionally substituted with C_1-C_4 alkoxy;

R^4 is $SO_2NR^7R^8$;

R^5 and R^6 are each independently selected from H and C_1 to C_4 alkyl optionally substituted with C_1 to C_4 alkoxy, or, together with the nitrogen atom to which they are attached, form a pyrrolidinyl, piperidinyl, morpholinyl or 4-R^9-piperazinyl group;

R^7 and R^8, together with the nitrogen atom to which they are attached, form a 4-R^{10}-piperazinyl group;

R^9 is C_1 to C_4 alkyl;

R^{10} is H or C_1 to C_4 alkyl optionally substituted with OH, C_1 to C_4 alkoxy or $CONH_2$;

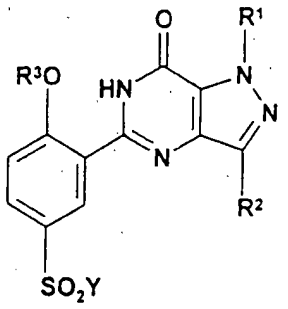
Het is a C-linked 6-membered heterocyclic group containing one

or two nitrogen atoms, optionally in the form of its mono-N-oxide, or a C-linked 5-membered heterocyclic group containing from one to four heteroatoms selected from nitrogen, oxygen and sulphur, wherein either of said heterocyclic groups is optionally substituted with one or two substituents selected from C_1 to C_4 alkyl optionally substituted with C_1 to C_4 alkoxy, C_1 to C_4 alkoxy, halo and NH_2;

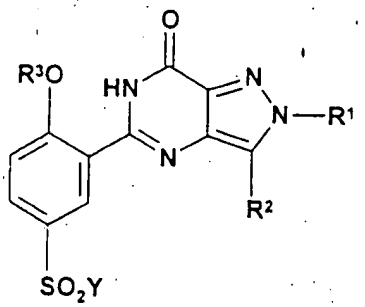
Ar is phenyl optionally substituted with one or two substituents selected from C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halo, CN, $CONH_2$, NO_2, NH_2, $NHSO_2$ (C_1 to C_4 alkyl) and SO_2NH_2;

and n is 0 or 1;

which comprises reacting a compound of formula (IIA) or (IIB), respectively:



(IIA)



(IIB)

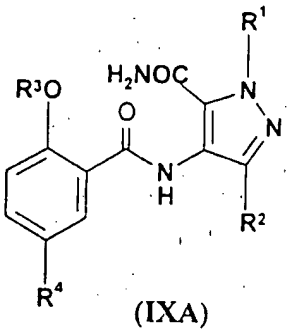
wherein Y is halo, and R^1, R^2 and R^3 are as previously defined in this claim, with a compound of formula (III):

$$R^7R^8NH \qquad (III)$$

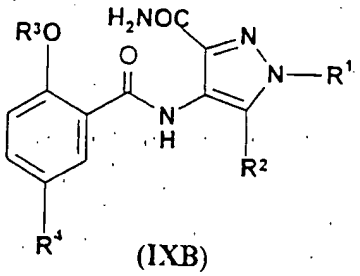
wherein R^7 and R^8 are as previously defined in this claim, optionally followed by formation of a pharmaceutically or veterinarily acceptable salt of the

required product or a pharmaceutically or veterinarily acceptable solvate of either entity.

21. A process for the preparation of a compound of formula (IA) or (IB) as defined in claim 20, or a pharmaceutically or veterinarily acceptable salt thereof, or a pharmaceutically or veterinarily acceptable solvate of either entity, which comprises cyclisation of a compound of formula (IXA) or (IXB), respectively:



(IXA)



(IXB)

wherein R^1, R^2, R^3 and R^4 are as previously defined for formulae (IA) and (IB) in claim 20, optionally followed by formation of a pharmaceutically or veterinarily acceptable salt of the required product or a pharmaceutically or veterinarily acceptable solvate of either entity.